Further, Claims 1, 3-7, 11, 12, 14, 16, 17, 20, and 21 were rejected under 35 U.S.C. §102(b) as anticipated by Kamae et al. (U.S. Patent No. 4,857,737) (hereinafter "the '737 patent"). Finally, Claims 2, 8, 9, 13, 15, 18, and 19 were rejected under 35 U.S.C. §103(a) as unpatentable over the '737 patent in view of DiFilippo et al. (U.S. Patent No. 5,793,045) (hereinafter "the '045 patent").

In response to the objection to the drawings, submitted herewith is a separate letter requesting approval of drawing changes, a marked-up copy of the drawings, and a clean copy of the drawings.

Claim 13 was rejected under 35 U.S.C. §112, second paragraph, as indefinite. In response, Claim 13 has been amended to correct antecedent basis problems. Thus, Applicants believe that this rejection of Claim 13 has been overcome

Claims 1, 3-7, 11, 12, 14, 16, 17, 20, and 21 were rejected under 35 U.S.C. §102(b) as being anticipated by the '737 patent. This rejection is respectfully traversed.

Claim 1 is directed to a nuclear medicine diagnostic apparatus including 1) at least one radiation detector having a plurality of semiconductor cells arranged in a matrix, 2) a selection circuit configured to select two types of events, 3) a position calculation circuit, 4) a counting circuit, and 5) a circuit configured to generate a distribution of radioisotope in a subject. Contrary to the assertion in the outstanding Office Action, Applicants respectfully submit that the '737 patent fails to disclose the "at least one radiation detector", "the selection circuit", and the "position calculation circuit", as recited in Claim 1.

The '737 patent discloses that "[a] detecting unit is formed by disposing 2-dimensional position sensitive type radiation detectors in the form of a plurality of layers superposed on each other...."[2] In contrast, each radiation detector recited in Claim 1 is

[2]Abstract of '737 patent; see also Figures 1, 2, and 4A.

comprised of "a plurality of semiconductor cells which are arranged in a matrix...." Thus, Applicants submit that the '737 patent does not disclose the radiation detectors of Claim 1.

Regarding the selection circuit of Claim 1, Applicants submit that the '737 patent does not disclose a selection circuit that selects among all radiation detection events "a first case wherein only one of said semiconductor cells outputs a signal, [and] compares an energy of the signal with a predetermined energy window...." The Office Action indicates that such a selection circuit is disclosed by Figure 6 and column 10, lines 54-62, of the '737 patent. However, as shown in Figure 4C[3], the case of N=1 is not uniquely selected.[4] In addition, the '737 patent does not disclose that, if N=1, the energy of the signal is compared to a predetermined energy window. As to Figure 6, the label on the abscissa indicates that the energy is the "total sum of energies detected in different layers", implying that this is the N>1 case.

Moreover, the '737 patent does not disclose a selection circuit that selects among all radiation detection events "a second case wherein not less that two semiconductor cells output...two signals substantially simultaneously, [and] calculates a total energy of the not less than two signals..." as recited in Claim 1. The '737 patent is silent as to whether, in the second case, the timing of the signals from the detectors is important, and does not disclose a selection circuit that selects an event in which the detectors output signals "substantially simultaneously". Rather, the device of the '737 patent calculates the incidence position for radiation events satisfying two conditions 1) N > 1, and 2) the energy leaking through to the anti-coincidence counter 2 is less than a predetermined value.

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[3]Figure 4C is disclosed in column 9, lines 53-55, to be "a flowchart for determining incidence direction...by using the anti-coincidence counter indicated in Figs. 4A and 4B."

[4]N is disclosed in column 7, lines 47-50, to be the "total number of reaction points within the detecting devices...(total number of hits)...."

Since the '737 patent does not disclose *selecting* the "first case" event recited in Claim 1, it can not teach the claimed position calculation circuit, which "in the first case, calculates an incidence position of the radiation on the basis of a position of said semiconductor cell that has output the signal...." . In this regard, the Office Action states that it is inherent in the apparatus of the '737 patent to "calculate an incidence position...on the basis of a position of said semiconductor cell that has output the signal since all of the energy of the 511 keV photon has been measured and thus there is no other signal from the rest of the semiconductor cells...."[5] However, Applicants submit that it is not inherent in the apparatus of the '737 patent to "calculate the incidence position" in the first case. In fact, Figure 4C of the '737 patent specifically teaches away from doing so. In attempting to provide a rationale or evidence tending to show inherency, the Office Action merely offers a *definition* of the first case ("thus there is no other signal from the rest of the semiconductor cells"). As stated in *In re Robertson:*[6]

> To establish inherency, the extrinsic evidence 'must make clear that the missing descriptive matter is necessarily present in the thing described in the reference...Inherency, however, may not be established by probabilities or possibilities. The mere fact that a certain thing may result from a given set of circumstances is not sufficient.'

The Office Action has not established "inherency" as required.

Thus, for the reasons stated above, Applicants submit that Claim 1 and dependent Claims 2-11 patentably define over the '737 patent.

Independent Claim 12 is directed to a nuclear medicine diagnostic apparatus including 1) at least one radiation detector having a plurality of semiconductor cells arranged

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[5]Page 4 of Office Action dated September 28, 2001.

[6]169 F.3d 743, 745, 49 USPQ2d 1949, 1950-51 (Fed. Cir. 1999)

in a matrix, 2) a selection circuit, 3) a position calculation circuit, 4) a counting circuit, and 5) a circuit configured to generate a distribution of radioisotope in a subject. For the reasons stated above with regard to Claim 1, Applicants submit that the '737 patent fails to disclose the at least one radiation detector as recited in Claim 12. Moreover, the '737 patent also fails to disclose the selection circuit of Claim 12.

The selection circuit of Claim 12 "causes...an event wherein not less that two semiconductor cells output not less than two signals substantially simultaneously, *not* to contribute to imaging..." (emphasis added). The Office Action indicates that the sections of the '737 patent asserted to teach the selection circuit of Claim 1 (in the second case), are also relevant to the selection circuit of Claim 12. However, as shown in Figure 4C, the apparatus of the '737 patent 1) does not detect an event defined by two signals being output from two semiconductor cells *substantially simultaneously*, and 2) does not cause such an event *not* to contribute to imaging. Thus, for the reasons stated above, Applicants submit that Claim 12 and dependent Claim 13 patentably define over the '737 patent.

Independent Claim 14 is directed to a nuclear medicine diagnostic apparatus including 1) at least one radiation detector having a plurality of semiconductor cells arranged in a matrix, 2) a position calculation circuit, 3) a counting circuit, and 4) a circuit configured to generate a distribution of radioisotope in a subject. The radiation detector(s) and position calculation circuit of Claim 14 incorporate limitations similar to those recited in Claim 1. Thus, for the reasons stated above for Claim 1, Applicants believe that Claim 14 and dependent Claims 15-17 patentably define over the '737 patent.

Independent Claim 20 is directed to a nuclear medicine diagnostic apparatus including 1) at least one radiation detector having a plurality of semiconductor cells arranged in a matrix, and 2) a circuit which "when not less than two semiconductor cells output not

less than two signals substantially simultaneously, calculates a total energy...." First, Applicants submit that the '737 patent does not disclose the radiation detector(s) of Claim 20 for the reasons cited above for Claim 1. In addition, Applicants submit that the circuit recited in Claim 20 is not disclosed in the '737 patent. As stated above, the '737 patent does not detect an event defined by two signals being output from two semiconductor cells substantially simultaneously. As a result, the '737 patent does not disclose the circuit of Claim 20. Thus, Applicants submit that Claim 20 and dependent Claim 21 also patentably define over the '737 patent.

Claims 2, 8, 9, 13, 15, 18, and 19 were rejected under 35 U.S.C. §103(c) as unpatentable over the '737 patent in view of the '045 patent. This rejection is respectfully traversed.

Independent Claim 18 is directed to a nuclear medicine diagnostic apparatus including 1) at least one radiation detector having a plurality of semiconductor cells arranged in a matrix, and 2) a circuit configured to calculate time differences between signals output from the semiconductor cells. First, Applicants respectfully submit that the '737 patent does not disclose the radiation detector(s) of Claim 18 for the reasons cited above for Claim 1. In the Office Action, the '045 patent is asserted to disclose the circuit recited in Claim 18, but not the radiation detector(s). Since neither the '737 nor the '045 patent teach the radiation detector(s) of Claim 18, the combination of their teachings is also deficient. Thus, Applicants respectfully submit that the rejection under 35 U.S.C. §103 has been overcome and that Claim 18 (and dependent Claim 19) patentably define over the '737 and '045 patents.

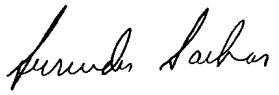
The present amendment adds new Claim 22, directed to a *method* for generating a distribution of a radioisotope. Claim 22 includes limitations similar to those recited in Claim

1. Thus Applicants respectfully submit that new Claim 22 patentably defines over the '737 patent.

Consequently, in view of the present amendment and in light of the above discussions, the outstanding grounds for rejection are believed to have been overcome. The application as amended herewith is believed to be in condition for formal allowance. An early and favorable action to that effect is respectfully requested.

Respectfully submitted,

OBLON, SPIVAK, McCLELLAND,
MAIER & NEUSTADT, P.C.



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Marked-Up Copy
Serial No: 09/521,901
Amendment Filed on: 12-27-01

IN THE CLAIMS

Please amend Claim 13 as follows:

13. (Amended) An apparatus according to claim 12, [further comprising] wherein said selection circuit includes an internal incidence circuit configured to determine the [second case] event not contributing to imaging, on the basis of a time difference among a plurality of signals output from said at least one radiation detector.

22. (New)

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